

REMARKS/ARGUMENTS

Claims 1 – 3 and 5 – 14 are presented for reconsideration and further examination in view of the foregoing amendments and following remarks. Claim 4 has been cancelled without prejudice or disclaimer.

In the outstanding Office Action, the Examiner objected to claim 13 due to informalities; rejected claims 3 – 4 under 35 U.S.C. §112, second paragraph as being indefinite; rejected claims 9 – 10 and 12 – 14 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,916,000 to Li et al. (hereinafter referred to as “the Li et al. ’000 patent”); and rejected claims 1 – 8 and 11 under 35 U.S.C. §103(a) as being unpatentable over the Li et al. ’000 patent in view of reference no. WO 00/42246 to Bottger et al. (hereinafter referred to as “the Bottger et al. ’246 reference”).

By this Response and Amendment, claims 3, 4 and 13 have been amended to provide additional clarity thereto; and the prior art rejections have been traversed.

It is respectfully submitted that no new matter, within the meaning of 35 U.S.C. §132, has been introduced to this application.

Claim Objection

The Examiner objected to claim 13 due to informalities. Specifically, the Examiner indicated that claim 13 is grammatically awkward.

Response

By this response and Amendment, Applicant has amended claim 13 for to provide more clarity. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the objection to claim 13.

Rejection Under 35 U.S.C. §112, Second Paragraph

The Examiner rejected claims 3 – 4 as being indefinite. Specifically, the Examiner stated that it is not clear what constitutes “part” of said fabric layers and “rest” of fabric layers.

Response

By this Response and Amendment, claim 4 has been cancelled, thereby rendering the rejection thereto moot; and claim 3 has been amended to recite more definite language. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejections to the claims.

Substantive Claim Rejections under 35 USC 102 and 35 USC 103

As a general comment, it is to be noted that the present invention claims specific combinations of features for providing an improved shell for a ballistic helmet made from paraaramide layers and bonding resin. In the claim rejections, the Examiner has provided a mosaicing of text portions, taken partially from different examples and also different references, to suggest that the such a combination of features as claimed are thus known or obvious. It is respectfully submitted that such a mosaicing has the benefit of hindsight in view of the present application and would not have been considered in this manner by a person having ordinary skill in the art at the time the application was filed, and further, such combinations do not disclose, teach or suggest all of the features of the invention as claimed.

Rejections Under 35 U.S.C. §102(b)

The Examiner rejected claims 9 – 10 and 12 – 14 as being anticipated by the Li et al.’000 patent.

Response

By this Response and Amendment, Applicant respectfully traverses the rejection since all of the features of the presently claimed invention are not disclosed, taught or suggested by the cited prior art. For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference. *Impax Laboratories Aventis v. Pharmaceuticals*, 468 F.3d 1366, 1381 (Fed. Cir. 2006).

Independent claim 9 recites a “[a]hell for ballistic helmet formed from a plurality of paraaramide fabric layers and bonding resin, wherein said plurality of layers is greater than 28 and said shell has average thickness less than 6.5 mm.” Independent claim 10 recites a “shell for ballistic helmet formed from a plurality of paraaramide fabric layers and bonding resin, wherein said plurality of layers is not less than 38.” And independent claim 12 recites a “[s]hell for ballistic helmet formed from a plurality of paraaramide fabric layers and bonding resin, wherein said plurality of layers is greater than 28 and said shell has average areal density less than 7.0 Kg/m².”

In contrast to the presently claimed invention, there is no disclosure, teaching or suggestion in the cited prior art of using paraaramid, nor of providing a shell for a ballistic helmet as recited in claims 9, 10 and 12. The Examiner cites column 18, lines 40-45, column 10, lines 35-50 and column 6, lines 5-10 of the Li et al. ‘000 patent as disclosing a ballistic material comprising 164 fabric layers comprising aramid fibers and resin matrix. Applicant respectfully disagrees. None of the citations disclose, teach or suggest all of the features of the presently claimed invention. The citation at column 18, lines 40 – 45 of the Li et al. ‘000 patent does not explicitly mention any fibers, but refers to “the prepreg sheet” of Example 1. Example 1 is directed to a “ballistic panel prepared by molding a plurality of sheets comprised of...polyethylene....”

Similarly, the citation at column 10, lines 35 – 50 of the Li et al. '000 patent does not mention any of the features of claims 9 – 10 or 12 – 14. In particular, it does not mention paraaramid fibers, or providing a shell for a ballistic helmet as recited in independent claims 9, 10 and 12. Column 6, lines 5 – 10 merely mentions a number of filaments that may be used, but does not provide any disclosure of the specific features of the rejected claims.

Further, the Examiner specifically cited column 19, lines 15 – 36 as disclosing “a composite comprising 30 layers, each having a thickness of 0.02cm.” However, there is no mention whatsoever of paraaramid fibers, or providing a shell for a ballistic helmet. The Examiner also cited column 19, lines 40 – 45 as teaching a composite panel with areal density of 6.02 Kg/m^2 . Again, there is no disclosure, teaching or suggestion of paraaramid fibers, or providing a shell for a ballistic helmet.

Finally, the Examiner also cited column 11, lines 1 – 21 as teaching a pressure bonding feature of 69,000 kpa (703 kg/cm^2). However, this refers to ECPE (polyethylene) filaments, and does not mention paraaramid fibers, or providing a shell for a ballistic helmet.

Applicant therefore respectfully submits that the cited references do not disclose the present invention as recited in claims 9 – 10 and 12. Similarly, as dependent claims necessarily contain all of the features of the independent claims from which they depend, Applicant submits that claims 13 – 14, which both depend from claim 12, are likewise patentable over the cited prior art. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejections.

Rejections Under 35 U.S.C. §103(a)

The Examiner rejected claims 1 – 8 and 11 as being unpatentable over the Li et al. '000 patent in view of the Bottger et al. '246 reference.

Response

By this Response and Amendment, Applicant respectfully traverses the rejection since there is no motivation to combine the references of the cited prior art combination and since all of the features of the presently claimed invention are not disclosed, taught or suggested by the cited prior art combination. To establish a *prima facie* case of obviousness, the Examiner must establish: (1) some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) the prior art references teach or suggest all of the claim features. *Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970).

The Examiner refers to his comments regarding the Li et al. '000 reference, and states that the combination of this reference with the Bottger et al. '246 reference, which according to the Examiner teaches "ballistic grade fabrics comprising paraamide fibers having an areal density of 100/m² (page 2, line 29 to page 5, line 10)," renders the claims obvious. On the contrary, there is no motivation to combine the Li et al. '000 patent with the Bottger et al. '246 reference.

The Li et al. '000 patent discloses an impact resistant composite having one or more layers in which at least one layer has a network of filaments having very specific properties, ***not including*** a particular areal density. The Bottger et al. '246 reference is concerned with a different type of material, comprising a double layer of fabric in which the threads in one layer are in transverse arrangement to those in the other layer and may have different properties. The Li et al '000 patent places particular emphasis on aligning the fibers of multiple layers along a common direction (column 2, lines 29 to 49; column 4, lines 20 – 26), and thus there is little motivation for a person having ordinary skill in the art to consider the Bottger et al. '246 reference in which the fibers in the double layers are transverse to one another, or thus to combine the two references.

Furthermore, it is to be noted that the Li et al. '000 patent states at column 19, lines 34 to 36 that the V_{50} results of 480 m/s were "far inferior" to those of examples 1 and 2, indicating that a person having ordinary skill in the art would not seek to combine this reference with another reference, Bottger et al. '246 reference, which provides similar "inferior" results (page 5, line 23 and 24 of the Bottger et al. '246 reference).

In any case, even if the references are combined, the combination does not disclose, teach or suggest all of the features of the presently claimed invention. Independent claim 1 recites "[s]hell for ballistic helmet formed from a plurality of paraaramide fabric layers and bonding resin, wherein said fabric layers have areal density equal or less than 200 g/m^2 , said shell has average thickness less than 6.5 mm and average areal density less than 7.5 Kg/m^2 ." And independent claim 11 recites a "[s]hell for ballistic helmet formed from a plurality of paraaramide fabric layers and bonding resin, wherein said fabric layers have areal density less than 200 g/m^2 , and said plurality of layers is greater than 28."

In Example 1 of the Li '000 patent (column 18, lines 40 to 45) previously cited by the Examiner, 164 layers are disclosed. Assuming an areal density of 100 g/m^2 for each layer (as disclosed by WO 00/42246, if the two references were to be combined), the overall areal density for the panel becomes 16.4 Kg/m^2 , which is much higher than the feature of claim 1 reciting an "average areal density less than 7.5 Kg/m^2 ". Furthermore, there is no disclosure, teaching or suggestion in the cited prior art combination of the other features of claim 1 and the features of claim 11, such as for example the "paraamide fibers," or the shell having an average thickness of less than 6.5mm.

Regarding Example 3 of the Li et al. '000 (column 19, lines 15 to 36) previously cited by the Examiner, 30 layers are disclosed. Assuming an areal density of 100 g/m^2 for each layer (as disclosed by the Bottger et al. '246 reference, if the two references were to be combined), this would result in an overall areal density for the panel of 3 kg/m^2 . However, it is not a proper combination of references to

simply assign a particular areal density to one type of fabric just because it is disclosed regarding another type of fabric. This is even more the case where by doing so worse results would ensue. For example, Example 3 gives a V_{50} of 480 m/s (see Table 1, column 21 of the Li et al. '000), and this is considered to be an "inferior" result. However, it is known from the WO reference (page 5, lines 23, 24) that between 40 and 42 layers are required to provide a V_{50} of between about 481 m/s and 471 m/s. Therefore by using 30 layers of areal density of 100g/m^2 a person having ordinary skill in the art would expect to result in inferior V_{50} performance re Example 3 of the US reference, and thus would not consider the Bottger et al. '246 reference at all.

Furthermore, there is no disclosure, teaching or suggestion in the cited prior art combination that the average thickness of shell would be less than 6.5mm as recited in claim 1. Certainly, if a person having ordinary skill in the art were to combine the two references to try to obtain at least the same results, for example by providing 40 – 42 layers of the fabric of areal density of 100g/m^2 , the thickness would be at least 8mm.

With particular respect to claim 5, column 11, lines 63 to 66 of the Li et al. '000 patent disclose that the *coating* of the fabric or filaments may be between 1% and 150% by weight of *the filaments*. Claim 5 refers to the *resin* being less than 12% of *the shell weight*. Further, it is indicated in column 12, lines 10 – 14 that when the coating is less than 60% (by volume of the filament), additional matrix material is required. There is therefore insufficient disclosure in the cited prior art combination to suggest that the matrix used "constitutes less than 12% of the shell weight" as recited in claim 5.

Applicant therefore respectfully submits that the combination of cited references does not render obvious the presently claimed invention as recited in independent claims 1 and 11. Similarly, as dependent claims necessarily contain all of the features of the independent claims from which they depend, Applicant submits that claims 2 – 7, which all ultimately depend from claim 1, are likewise

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patentable over the cited prior art. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejections.

CONCLUSION

In light of the foregoing, Applicants submit that the application is now in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner contact the undersigned attorney if it is believed that such contact will expedite the prosecution of the application.

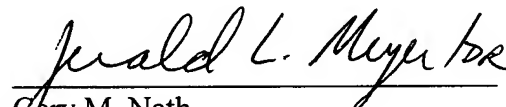
In the event this paper is not timely filed, Applicants petition for an appropriate extension of time. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 14-0112.

Respectfully submitted,

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